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February 7, 1996

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

By Messenger

William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Re: CC Docket No. 92-297, RM-7872, RM-7722
Ex Parte Presentation

Dear Mr. Caton:

The enclosed written materials were delivered today to Mr. Thomas Tycz and the other Commission representatives listed thereon.

An original and four copies of this letter are enclosed.

Respectfully submitted,

John P. Janka

Enclosures

No. of Copies rec'd 0+4
List ABCDE

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February 7, 1996

Via Messenger

Thomas S. Tycz
Chief, Satellite and
Radio Communication Division
International Bureau
Federal Communications Commission
2000 M Street, NW, Room 811
Washington, D.C. 20554

Re: CC Docket 92-297
28 GHz Spectrum Band Plans

Dear Mr. Tycz:

This letter clarifies certain matters that were discussed in the status conference that was held for this proceeding on February 5, 1996.

At the February 5, 1996 status conference, Hughes proposed an interpretation of the "Option 2" 28 GHz band plan, called "Option 2B" that would obviate the need for NGSO MSS feeder link sharing with LMDS and would instead provide for LMDS and the NGSO FSS to share 100 MHz of the Ka band at 28.6-28.7 GHz, which LMDS could use on a bi-directional basis (including its return links), and which NGSO FSS could use for "gateway", or "gigalink" earth stations. A copy of that proposal is attached to our ex parte presentation of February 6, 1996.

First, I would like to clarify a misunderstanding that has arisen about the extent of LMDS and NGSO FSS sharing under that proposal. The Commission's options summary of January 25, 1996 indicated the 28.6-28.7 GHz band as "WRC-97" spectrum,

which we understood as an indication that the Commission would not address the issue of GSO or NGSO FSS priority in this part of the band (and may not license satellite use of that band) until after WRC-97. Therefore, we indicated in our presentation materials that LMDS could use that part of the band "clear" of other uses. What was implied in our presentation materials and stated more clearly at the meeting was that if NGSO FSS was allocated that 100 MHz at WRC-97, NGSO FSS systems also could use that band for "gigalink" terminals on a shared basis with LMDS.

At the status conference, a representative of Teledesic opposed this proposal on the grounds that (i) Teledesic needed all 500 MHz of the 28.6-29.1 GHz band for its so-called "standard" terminals, and that it is not feasible for Teledesic's standard terminals to share with LMDS, and (ii) that solution would be inconsistent with the U.S. position at WRC-95. Teledesic is wrong on both counts.

As Hughes indicated at the status conference, the record in this proceeding is explicitly clear that Teledesic's gigalink terminals can share spectrum with LMDS and that the Commission has proposed to provide only 400 MHz of NGSO FSS spectrum for standard terminals, the additional 100 MHz is intended for gigalinks.

(i) In the *Third NPRM*, noting that Teledesic had proposed to operate its standard, or user, terminals over 400 MHz of spectrum, but that designating only 400 MHz of primary NGSO FSS spectrum would relegate all of Teledesic's gateways to secondary status with respect to GSOs, the Commission provided an additional 100 MHz to Teledesic for gigalink use: "The additional 100 MHz will ensure that at least some spectrum could be used for gateway terminals, and not be subject to secondary user constraints and RR 2613." *Third NPRM* at ¶¶ 56-57.

(ii) In the *Third NPRM*, citing the results of the 28 GHz Negotiated Rulemaking, the Commission found that NGSO gigalink terminals (gateways) could operate on a shared basis with LMDS, particularly as proposed at 27.50-28.35 GHz. *Third NPRM* at ¶¶ 39, 45.

(iii) In its Comments on the *Third NPRM*, Teledesic wholeheartedly supported the Commission's conclusion: "[T]he FCC recognizes that limited sharing of the 27.50-28.35 GHz band between LMDS and gateway and gigalink terminals of NGSO satellite systems can be achieved." *Comments of Teledesic* (Sept 7, 1995) at 7. Teledesic went on to state that it supported certain downlink band pairings because it would "preserve the availability of the 27.50 - 28.35 GHz

[LMDS] band on a secondary basis for gigalink terminals and gateways for NGSO satellite systems like Teledesic." *Id.* at 8.

(iv) In its Reply Comments, Teledesic argued for abandoning any sharing between NGSO and GSO systems in the downlink bands in favor of sharing between LMDS and NGSO, stating that "the paired 27.50 - 28.35 GHz and 17.70 - 18.55 GHz bands is a logical place for the operation of Teledesic's gigalink terminals and the gateway terminals of other NGSO systems." *Reply Comments of Teledesic* (October 10, 1995) at 10.

(v) The Bellcore Study, prepared and submitted by a number of LMDS proponents, also found that Teledesic's gigalink terminals could share spectrum with LMDS, given their limited locations. *Bellcore Study* (April 1995) at Section 4.1, p 33. In particular, Bellcore found that the relatively few Teledesic gigalink terminals could be located with traditional methods of frequency coordination to ensure that LMDS would not experience harmful interference.[1/]

No one has disputed that it is feasible for LMDS to share spectrum on a bi-directional basis with the proposed Odyssey NGSO MSS system. And it appears feasible for LMDS to obtain suitable return links in that part of the shared band. Working with this as a starting point, Hughes engineers have analyzed whether the differences between Odyssey gateways and Teledesic gigalinks make it easier or harder for LMDS to share with Teledesic than with Odyssey. A brief technical analysis is attached.

The bottom line is that Teledesic gigalinks and TRW feeder links are so similar that it is no harder for LMDS to share with Teledesic. In fact, the LMDS "exclusion zones" that might exist around a Teledesic gigalink would be significantly smaller than those that would surround a TRW site: about 100 times smaller in distance and about 10,000 times smaller in area. Thus, the Hughes analysis confirms both the Commission's and Teledesic's conclusions about gigalink/LMDS sharing.

With respect to the U.S. position at WRC-95 and 97, there are two points. First, the U.S. has never suggested in the context of advocating 500 MHz of spectrum for

---

1. Although Hughes has differed with the other conclusions in the Bellcore Study, no one has rebutted its conclusion about the possibility of sharing between LMDS and the Teledesic gigalink terminals.

Teledesic that there should be any change whatsoever in the current co-primary allocation of the 28.6-29.1 GHz band to the terrestrial fixed service, of which the Commission has determined LMDS is a subset. Thus, sharing between LMDS and Teledesic conforms with the existing ITU allocations in this band. Moreover, in a number of WRC-95 position papers and proposals drafted by Teledesic, the U.S. emphasized the compatibility of its earth stations with terrestrial fixed services. See, e.g., WRC-95 Document 9-E, corrigendum 1 to addendum 15. Any U.S. domestic allocation of the 28 GHz band that provided for Teledesic gigalinks to share 100 MHz on a co-primary basis with LMDS therefore is fully consistent with U.S. WRC positions.

In conclusion, the LMDS/Teledesic gigalink sharing proposal in Option 2B is technically viable, consistent with the record in this proceeding, and compatible with U.S. WRC positions.

Sincerely yours,

John P. Janka
Steven H. Schulman

Enclosure

cc: Chairman Reed E. Hundt
Commissioner James H. Quello
Commissioner Andrew C. Barrett
Commissioner Susan Ness
Commissioner Rachelle Chong
Ms. Michelle Farquhar
Ms. Jennifer Gilsenan
Mr. Donald Gips
Mr. Robert James
Mr. Karl Kensinger
Ms. Susan Magnotti
Dr. Michael Marcus
Mr. Harry Ng
Dr. Robert Pepper
Mr. Gregory Rosston
Mr. David Wye

INTERDEPARTMENTAL CORRESPONDENCE

HUGHES

TO: FILE
ORG: T1-08-T2

C: R. Rey
G. Hrycenko

DATE: February 7, 1996
REF:

SUBJECT: Teledesic and LMDS Sharing

FROM: Roger LeClair
ORG: TM-60-10

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This memorandum presents the results of a brief study to support the notion that co-frequency and co-directional sharing at 28 GHz is possible between ubiquitously located LMDS terminals and the high gain Teledesic Gigalink Terminals (TGT). This conclusion follows the stipulation that and accepted fact that Odyssey feeder-link terminals can coexist on the same basis with the LMDS. Furthermore, the implications are consistent with the conclusions reached at the NRM proceeding on 28 GHz conducted by the FCC in fall of 1994. The analyses presented in this memorandum uses accepted and validated practices adopted in that proceeding.

The attached charts show the interference condition between LMDS and satellite earth stations using the methodology from the FCC's 28 GHz Negotiated Rule Making (NRM). The charts show the distance that must be maintained between the LMDS receivers and the satellite earth station as a function of the LMDS receiver antenna off-axis angle. The methodology used in the NRM is very conservative; free space propagation is assumed and worst-case orientations are used. While further study using time-domain simulation can be used to show that the impact of service availability to LMDS is negligible, these studies require additional time for their preparation and could be provided in a period of two to three weeks if this form of addition technical evidence is deemed essential. Nonetheless, the results attached to this memorandum serve as a useful comparison between systems and unequivocally demonstrate that technical sharing is possible.

The first chart shows the exclusion zone between the Cellularvision (Suite 12) LMDS network and the TGT. In the backlobe of the LMDS receiver, the separation distance is 32 ft. (This data is identical to that presented on page 168 of the LMDS/28 GHz NRM Report.) The second chart shows the

condition for an Odyssey feeder-link terminal. Here, the backlobe separation distance is about 3200 ft which is two orders of magnitude larger than for Teledesic.

The main reasons for this large difference are:

1) The Odyssey feeder-link uplink needs higher power to reach the higher MEO orbit compared with the Teledesic LEO orbit, and
2) The Odyssey earth stations operate down to a much lower elevation angle than does Teledesic (10° for Odyssey vs. 40° for Teledesic).

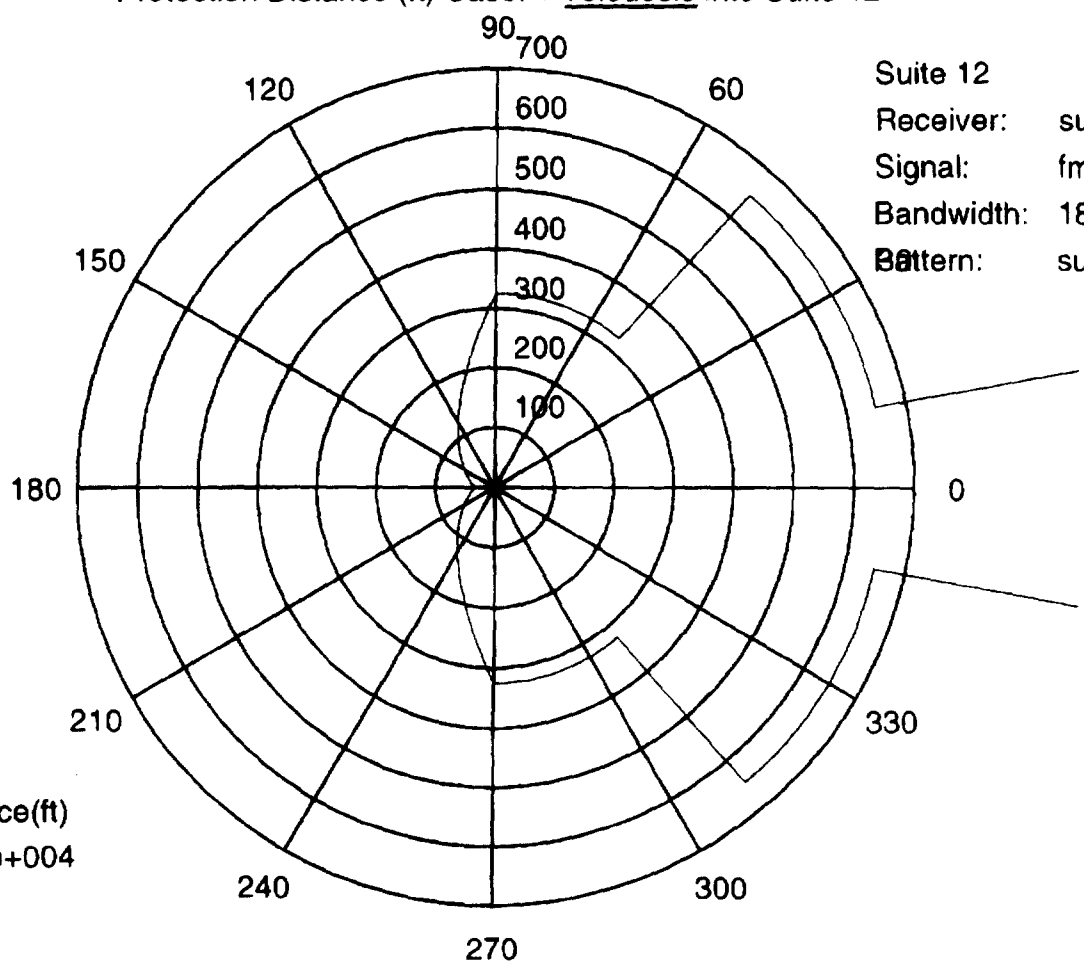
This combination provides a much higher EIRP into the LMDS receiver from an Odyssey feeder-link station compared to Teledesic.

Given that sharing is possible between LMDS and Odyssey, it seems assured that sharing is also possible between LMDS and the Teledesic TGT terminal. While it can be argued that the number of TGTs could be greater that the number of Odyssey F/L sites, the size of the exclusion zones is significantly (two orders of magnitude in radius and four orders of magnitude in area) smaller and as a result more than compensating for the increase in the number of potential interference sites.

Protection Distance (ft) Case: 1 Teledesic into Suite 12

Teledesic	
Terminal:	tgt
Signal:	oc24
Bandwidth:	800
Pattern:	itu
El. angle:	40

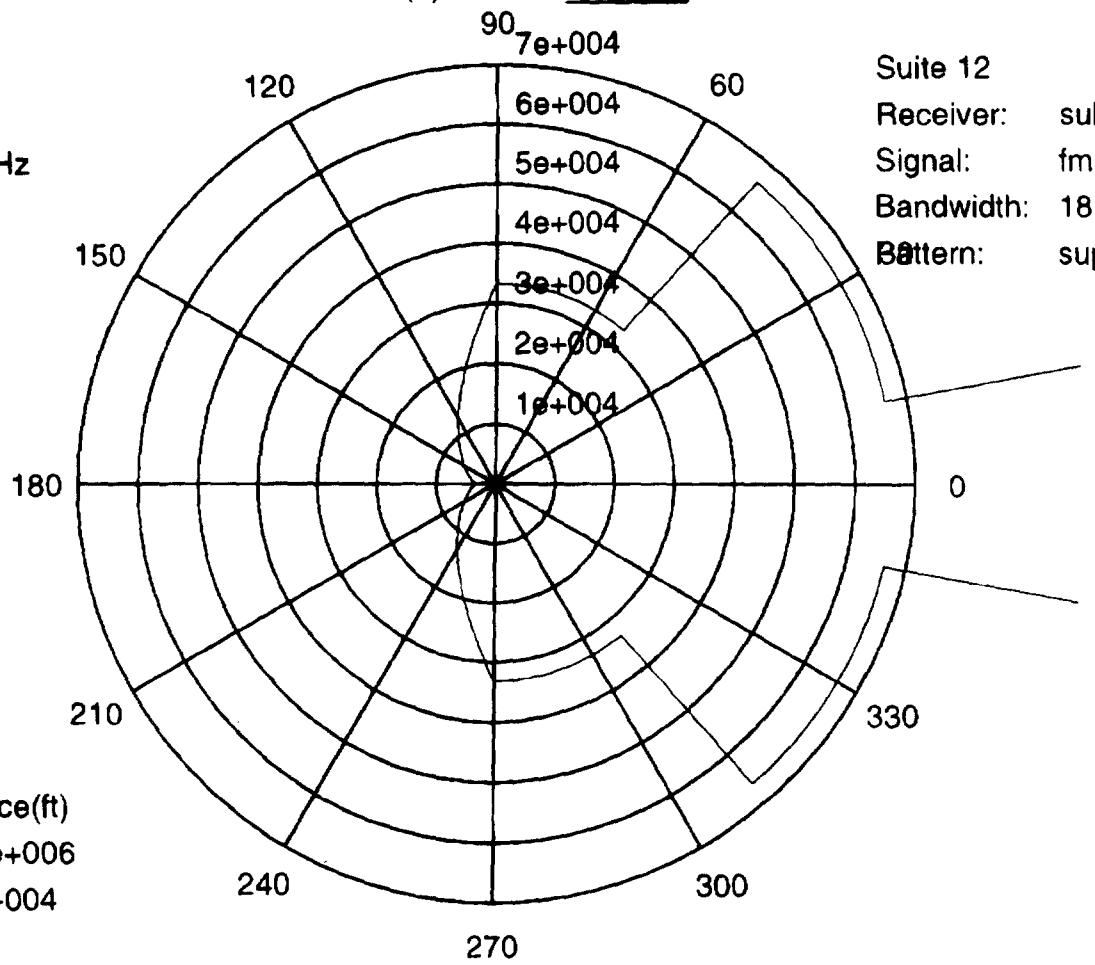
Suite 12	
Receiver:	subscriber
Signal:	fm
Bandwidth:	18
Pattern:	supplied



Angle	Distance(ft)
0	1.027e+004
45	648.2
180	32.49

Protection Distance (ft) Case: 2 Odyssey into Suite 12

Odyssey	
Terminal:	fl
Signal:	2.5 MHz
Bandwidth:	2.5
Pattern:	itu
El. angle:	10



Suite 12	
Receiver:	subscribe
Signal:	fm
Bandwidth:	18
Pattern:	supplied

Angle	Distance(ft)
0	1.051e+006
45	6.63e+004
180	3323